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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/881,782	06/18/2001	Takashi Udagawa	Q61741	1610

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EXAMINER

BROCK II, PAUL E

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 03/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/881,782

Applicant(s)

UDAGAWA, TAKASHI

Examiner

Paul E Brock II

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 8-10 and 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 11-14, 16, 19 and 20 is/are rejected.
- 7) ☒ Claim(s) 5, 7, 15 and 17 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species III in Paper No. 7 is acknowledged.
2. Claims 8-10 and 18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 7.

Information Disclosure Statement

3. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

4. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected

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drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 4 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear in these claims if “second conduction-type surface ohmic electrodes” include “said second conduction-type surface ohmic electrode” recited in the claims from which they depend, or if “second conduction-type surface ohmic electrodes” refers to an entirely different set of electrodes.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

8. Claims 11 – 13, 16, 19 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Ming-Jiunn et al. (USPAT 6078064, Ming-Jiunn).

With regard to claim 11, Ming-Jiunn discloses in figure 7 an electrode for group-III nitride semiconductor light-emitting diodes for a group-III semiconductor light-emitting diode comprising at least a gallium nitride (GaN)-based group-III nitride crystal layer (13/14) having a light-emitting part of hetero-junction structure, and a window layer (11b) comprising an electrically conducting transparent oxide crystal layer provided on the group-III nitride crystal layer, wherein at least a surface ohmic electrode (42) conductive with the window layer is between the surface of the group-III nitride crystal layer and the window layer and comes into contact with the surface of the group-III nitride crystal layer and a pad electrode for wire bonding is on the center of the upper surface of the window layer.

With regard to claim 12, Ming-Jiunn discloses in figure 7 wherein the second conduction-type surface ohmic electrode is disposed in a periphery of the pad electrode.

With regard to claim 13, Ming-Jiunn discloses in figure 7 wherein the second conduction-type surface ohmic electrode is disposed at a bilaterally symmetric position with respect to the center of the pad electrode.

With regard to claim 16, Ming-Jiunn discloses in figure 7 wherein the second conduction-type surface ohmic electrode is disposed in an open light-emitting region other than a projective region of the pad electrode on the surface of the group-III nitride crystal layer.

With regard to claim 19, forming a surface ohmic electrode in contact with a surface of a gallium nitride (GaN)-based group-III nitride crystal layer having a light-emitting part of hetero-

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junction structure. Ming-Jiunn discloses in figure 7 then covering the surface of the group-III nitride crystal layer and the surface ohmic electrode to form a window layer comprising an electrically conducting transparent oxide crystal layer conductive with the surface ohmic electrode. Ming-Jiunn discloses in figure 7 then forming a pad electrode for wire bonding on a center of the upper surface of the window layer conductive with the window layer.

With regard to claim 20, Ming-Jiunn discloses in figure 7 wherein the pad electrode is formed on the group-III nitride crystal layer through a window layer comprising an electrically conductive transparent oxide crystal layer so that the electrically conducting transparent oxide crystal layer is not present on the surface of the pad electrode used for wire bonding.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1 – 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ming-Jiunn in view of Ohba et al. (USPAT 5076860, Ohba).

With regard to claim 1, Ming-Jiunn discloses in figure 7 a group-III nitride semiconductor light-emitting diode comprising at least a first conduction-type single crystal substrate (52) provided with a first conduction-type back-surface ohmic electrode (19) on a back surface thereof, a buffer layer (16) on a front surface of the single crystal substrate, a gallium

nitride (GaN)-based group-III nitride crystal layer (13/14) having a light-emitting part of hetero-junction structure on the buffer layer, and a window layer (11b) comprising an electrically conducting transparent oxide crystal layer on the group-III nitride crystal layer, wherein at least a second conduction-type surface ohmic electrode (42) conductive with the window layer is between the surface of the group-III nitride crystal layer and the window layer and comes into contact with the surface of the group-III nitride crystal layer and a pad electrode for wire bonding is on the center of the upper surface of the window layer. Ming-Jiunn does not teach that the buffer layer comprises a boron phosphide (BP)- based material. Ohba teaches in figure 13 a buffer layer (62) comprising a boron phosphide (BP)-based material on a front surface of a single crystal substrate (61). It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the boron phosphide buffer layer of Ohba in the device of Ming-Jiunn in order to form an indirect transition buffer layer as stated by Ohba in column 11, lines 30 – 35.

With regard to claim 2, Ming-Jiunn discloses in figure 7 wherein the second conduction-type surface ohmic electrode is disposed in a periphery of the pad electrode.

With regard to claim 3, Ming-Jiunn discloses in figure 7 wherein the second conduction-type surface ohmic electrode is disposed at a bilaterally symmetric position with respect to the center of the pad electrode.

With regard to claim 6, Ming-Jiunn discloses in figure 7 wherein the second conduction-type surface ohmic electrode is disposed in an open light-emitting region other than a projective region of the pad electrode on the surface of the group-III nitride crystal layer.

Allowable Subject Matter

11. Claims 5, 7, 15 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. Claims 4 and 14 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not disclose or suggest, either singularly or in combination, at least a plurality of second conduction-type surface ohmic electrodes disposed in a pattern that are covered by a conducting transparent oxide layer with a pad electrode on a central portion of the transparent oxide layer.

Conclusion


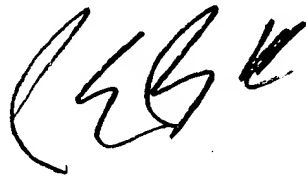
14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Russell et al. discloses a plurality of ohmic electrodes covered by a transparent conducting oxide. Kashimoto discloses a boron phosphide buffer layer. Tamaki et al. and Kamakura et al. both discloses an ohmic electrode covered by a transparent conducting oxide.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul E Brock II whose telephone number is (703)308-6236. The examiner can normally be reached on 8:30 AM-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703)308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Paul E Brock II
March 6, 2002



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